THE VETERINARY RECORD

FOUNDED BY WILLIAM HUNTING, F.R.C.V.S., 1888.

No. 22. MAY 30, 1942. VOL. 54.

Observations on Phenothiazine as an Anthelmintic in Horses and with Reference to Blood Examination

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INTRODUCTION.—Due to the kindness of Major Gillmor, R.A.V.C., an opportunity was given to test further the efficacy of phenothiazine and its effect, if any, on the blood picture of the horse and the worm content of the digestive tube. Four regimental horses were to be destroyed for various reasons. Two were not considered suitable for blood work but satisfactory for the other part of the experiment.

It was decided that an attempt be made to estimate (1) the number of worm eggs before and after dosing with phenothiazine; (2) the number of worms in the faeces over a period of three days after dosing with phenothiazine; (3) the number of worms remaining in the digestive tube at *post-mortem* examination, and also to examine the blood before and after dosing with phenothiazine.

Worm Count

The method adopted was as follows. After the animal had been dosed all faeces passed were collected daily for at least three days. The larger strongyle species were counted individually and an estimate was obtained of the number of the smaller species. This was done by making a suspension of the faeces in a suitable volume of water and counting all the worms in measured random samples of the suspension. The same technique was used with the gut contents at *post-mortem*. Worm-egg counts were made before dosing and at *post-mortem*.

Table I shows the estimated numbers of small strongyles, mainly Trichonema spp. passed, after dosing with phenothiazine.

TABLE I

Horse No.	C.37	D.85	A.77	D.19
Dose	25 gm.	35 gm.	30 gm.	30 gm.
Time after dose :—				
0 to 24 hours ..	60	80	50	50
24 „ 48 „ ..	22,900	57,800	45,000	10,000
48 „ 72 „ ..	800	500	100	1,500
72 „ 96 „ ..	—	200	—	300
Totals	23,760	58,580	45,150	11,850

Few observations are available on the numbers of the smaller strongyle species which may be harboured by an infested horse, and the figures shown in Table I are large; but Harwood *et al.*[4] have recorded similar numbers from three horses and a mule which had received phenothiazine. The table shows clearly that the great bulk of the worms killed by the drug are expelled on the second day after dosing, but that some may be passed as late as the fourth or fifth day.

TABLE II

Shows details of the numbers of worms passed after dosing and of the numbers remaining at *post-mortem* examination

Horse		Small Strongyles mainly Trichonema spp.	Strongylus spp.	Adult *Oxyuris equi*	Immature *O. equi*	*Parascaris equorum*	Worm Egg Counts E.P.G. Before dose	Worm Egg Counts E.P.G. 6 days after dose
D.85	Passed after dosing	58,580	4	0	0	0	1,860	60
	Remaining at p.m.	200	0	0	0	0		
A.77	Passed after dosing	48,150	6	0	700	0	1,800	120
	Remaining at p.m.	200	5	5	600	6 (immn.)		
D.19	Passed after dosing	11,850	45	0	100	0	1,120	0
	Remaining at p.m.	0	4	7	300	0		

Table II shows that the evidence of he worm egg counts its confirmed by the very small number of worms recovered at *post-mortem* examination. The drug caused the expulsion of very nearly 100 per cent. of the smaller strongyle species, and over 85 per cent. of the Strongylus spp. present in the three horses examined. No effect was observed on adult *Oxyuris equi* or immature *Parascaris equorum*, but very few of these parasites were present and therefore no definite conclusions can be drawn. Nearly 50 per cent. of the young stages of *O. equi* were, however, removed by the drug. The results shown in Table II agree closely with those obtained by Habermann *et al.*[5] in America.

Several verminous aneurysms were present in the mesenteric arteries of D. 85 and these contained living specimens of *Strongylus vulgaris*, evidently unaffected by the drug. These worms are not included in Table II.

Blood Picture

Most drugs interfere with the blood picture as do most diseases. From previous experience it had been noted that phenothiazine caused little alteration of the blood picture of the horse. This occasion, however, gave an opportunity to re-examine this statement. It is usual to associate with metazoan infestations an eosinophilia, but the relationship of the two conditions is not clear. It is open to question whether strongyles harboured in the intestinal tract of the horse, are responsible for eosinophilia. An increase in the number of eosinophils in the circulation is said by Britton[2] to be noticed in some horses with acute verminous aneurysms. This statement is difficult to corroborate or dispute in the living horse. Aneurysms in the living horse are difficult to detect, although quite common in aged horses. It is also stated by the same author[1] that even in horses affected with verminous aneurysms eosinophilia is not a necessary concomitant.

METHOD.—The blood was taken in the usual way from the jugular veins, films were made and stained by Leishman's stain. The ordinary blood pipettes were used and the usual diluting fluids. The Metz method[3] of counting the blood cells was adopted.

The percentage haemoglobin was calculated by using the Dare, Sicca and Tallqvist haemoglobinometers. In the differential count 1,000 cells were counted and the percentage given. In making the blood picture 1,000 cells were usually counted and brought to a percentage basis. The much-discussed question of grading the neutrophils was considered on the formula that the joining filament between the lobes of the nucleus must be so thin as to be almost immeasurable.

Another point of some moment, and one which may cause variation in the estimation of band meta-myelocytes and polymorphonuclear leucocytes grade I, is whether the single mononuclear cell of the neutrophil type, in which the nucleoplasm is irregular, should be considered a metamyelocyte or a poly I. In this paper these cells have been classified in the poly I percentage and only the cells with a single nucleus of the non-irregular form are placed in the metamyelocytic group.

HORSE D.19

	Before dosing	24 hours after dosing	48 hours after dosing	72 hours after dosing	6 days after dosing
R.B.C.s ..	7,200,000	8,000,000	8,350,000	8,100,000	7,320,000
W.B.C.s ..	8,787	7,750	11,000	7,375	6,625
Av. Haemoglobin	74%	85%	94·3%	85·6%	83·3%
Colour Index ..	0·52	0·7	0·59	0·51	0·61
Poly. 1	38%	50·57%	43·2%	54·5%	57·1%
Poly. 2	10·025%	6·6%	10·3%	9·3%	6·3%
Poly. 3	0·2%	0·33%	0·3%	Nil	Nil
Eosinophils ..	7·65%	6·6%	4·3%	3%	2%
Basophils ..	0·5%	0·3%	Nil	0·6%	Nil
Monocytes ..	4·125%	1·3%	3·3%	3%	2%
Lymphocytes ..	39·5%	34·3%	38·6%	29·6%	32·6%

HORSE A.77

	Before dosing	24 hours after dosing	48 hours after dosing	72 hours after dosing	5 days after dosing	6 days after dosing
R.B.C.s	6,130,000	7,550,000	7,800,000	7,430,000	7,720,000	7,400,000
W.B.C.s	5,650	6,375	5,500	6,375	5,650	5,187
Av. Haemoglobin	83·3%	91·6%	83·3%	85%	93·3%	86·6%
Colour Index ..	0·65	0·6	0·53	0·6	0·6	0·54
Poly. 1	39·7%	44·6%	51·1%	39·8%	44·3%	43·8
Poly. 2	11·8%	11·6%	9%	9%	7·3%	11%
Poly. 3	0·9%	0·6%	1%	0·3%	0·6%	0·3%
Eosinophils ..	4%	Nil	3·3%	2·3%	1·%	1·6%
Basophils ..	Nil	Nil	Nil	0·3%	Nil	1%
Monocytes ..	2·3%	4·6%	4·6%	3·3%	3·6%	5%
Lymphocytes ..	41·3%	38·6%	31%	45%	43·2%	37·3%

R.B.C.s.—There is a definite increase to a peak between 48-72 hours after dosing. This increase appears to be constant for at least seven days after.

W.B.C.s.—The number is increased to a peak approximately 72 hours after dosing with a gradual fall to normal.

Haemoglobin.—Reached a peak between the third and fifth day after dosing and fell back to the original percentage about the seventh day.

Colour Index.—Becoming constant about the sixth day.

Polymorphonuclear Leucocytes I.—There was a sudden increase with a peak about the 48th hour, followed by a sudden fall and a gradual increase to the seventh day.

Poly. II.—A sudden decrease to the second day, followed by a gradual increase to the sixth day.

Poly III.—There is a slight increase 48 hours after dosing.

Eosinophils.—In both animals the number of cells fell below the number present before dosing.

Basophils.—Slight increase.

Monocytes.—Each animal showed a different reaction but reaching a common point at 72 hours; diverging from this point A. 77 increasing in number and D. 19 diminishing in number.

Lymphocytes.—A gradual fall in number to 48 hours, with a slight increase at 72 hours and a more gradual fall to almost below the level of the first peak at 48 hours.

Post-Mortem Examination

(This part of the work was very carefully and skilfully carried out by Mr. J. W. Whittick, of the Pathology Department, Royal (Dick) Veterinary College.)

HORSE D.19

The macroscopical pathological changes were limited to the lung, liver, small intestine and cranial mesenteric artery. Each diaphragmatic lobe of the lung contained a sub-pleural calcareous nodule of about 1 cm. diam., which shelled out readily from a fibrous capsule. Two opaque white areas (larger 5×4 cm.) of capsular thickening were present on the cranial surface of the liver, while elsewhere there were several superficial, firm, discrete, white nodules of about 0·2 cm. diam. In the wall of the small intestine two firm, slightly projecting, white nodules, each of about 0·2 cm. diameter, were visible from the serosal surface. A firm, fairly smooth, brownish plaque (1·6×1·3×0·6 cm. thick) was present in the wall of the ileo-caeco-colic artery.

MICROSCOPIC FINDINGS.—*Liver.*—Sections of one of the superficial nodules show an area in which there is destruction of hepatic cells and their replacement by lymphocytes, organised into lymphoid follicles in part, plasmacytoid and epithelioid histiocytes, fibroblasts, young capillaries and great numbers of eosinophils. Small groups and some single liver cells are isolated in this chronic inflammatory focus. Several arterioles in the area show obliterative changes. Neighbouring portal tracts and the overlying capsule are infiltrated by lymphocytes and eosinophils. No parasites are recognisable.

Lungs.—The two large nodules were not examined histologically. Pieces of lung elsewhere show fairly large numbers of eosinophils in peribronchial connective tissue and in the mucosa of bronchioles.

Several small areas of fibrosis, infiltrated by eosinophils, are related to branches of pulmonary veins.

Small Intestine.—The nodules consist of central, partly calcified necrotic material surrounded by eosinophils, small mononuclear histiocytes with excentric pyknotic nuclei, larger histiocytes of irregular shape with pale nuclei and lymphocytes, all enclosed in fibrous tissue densely infiltrated by eosinophils. The submucosa, for some distance round about, is fibrosed and infiltrated by large numbers of eosinophils.

Cranial Mesenteric Artery.—Typical chronic verminous arteritis.

All these lesions probably represent the path of migration of nematode larvae.

HORSE A.77

Gross pathological changes comprised atrophy of the right lobe of the thyroid (3·9×2·3×0·9 cm.), a few opaque, greyish-brown areas (largest 4×2·5 cm.) covered by short fibrous tags on the cranial surface of the liver, and slight vesicular emphysema of the apical lobes of the lungs.

MICROSCOPIC FINDINGS.—*Thyroid.*—Cystic and atrophic right lobe.

Liver.—The areas of opacity show capsular thickening with projecting, almost acellular, fibrous processes covered by a single layer of mesothelium. There are occasional small groups of lymphocytes in portal tracts, but no lymphoid follicles.

Lung.—Apart from slight vesicular emphysema, the lungs are normal. No areas of fibrosis about vessels are evident, and there is no eosinophil infiltration of bronchiolar mucosa.

Small Intestine.—Relatively few eosinophils are present in the mucous membrane.

Unlike the previous case, eosinophils are scanty in the tissues and signs of nematode migration are few.

DISCUSSION

It will be observed that the tissues of the horse D.19 under microscopic examination revealed concentrated areas of eosinophils. The blood picture immediately before death was more or less normal. The blood picture before dosing indicates an increase in the number of eosinophils, followed after dosing by a gradual fall to normal. Interpretation of this condition could be explained in several ways. It is perhaps reasonable to suggest the exciting agency of a secretion from the verminous invader on the local histioblasts, resulting in the differentiation of eosinophils. The path of the immature worms is nearly always associated with the larger vessels, and it will be noted the path of the aggregations of eosinophile cells is similar. These areas, the liver, lung, etc., are considered to be generally haemopoietic sites but not necessarily eosinophilic. In the examination of the blood of this animal no pre-eosinophilic cells were encountered, but in the tissues many were observed.

The bulk, the size of the granules, the slow, ponderous, bulging movement of the cytoplasm carrying the granules may provide an effective bar to diapedesis of eosinophils into the blood stream from these sites. Therefore, although the tissues may be rich in live cells the blood stream does not always reflect their presence.

It will be noticed that horse A.77 has a much higher count of strongyles than D.19 and that the eosinophilic estimation of the tissues is low. It will be noted also that migration of strongyles along the usual channels was absent.

It does suggest that the exciting secretion or irritation is produced only effectually during the migration period of the strongyles. To confirm such a suggestion, however, much more evidence than that observed in the above two horses would require to be taken.

Summary

The fluctuations of the blood cells as shown are so slight that they are not considered of any great significance. Eosinophilia is not necessarily a concomitant of strongyle infection even when aneurysms are present.

The data obtained from the four horses show that phenothiazine administered at dose rate of 25-30 grammes per horse gives excellent results against all the smaller strongyles and strongylus spp.; moderate results against young stages of *Oxyuris equi*: and has no effect on adult *O. equi* and immature *Parascaris equorum*.

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Mr. H. Crow, Assistant Secretary of the Department of Agriculture for Scotland, speaking in Edinburgh, said that 30 years ago the wage of most married ploughmen was £32 per year and cash. The minimum rate to-day is £140, which, allowing for the difference in the value of money, is an increase of over 100 per cent. Men's wages in the third year of the last war were 38s. 6d. per week, while to-day the minimum is 60s. There have been corresponding advances in the wages of women.

Observations on the Blood-Picture of Sheep Treated with Phenothiazine

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Introduction.—Errington and Westerfield (1940), and others, have shown that the administration of phenothiazine to horses produces an anaemia. In a recent paper (1941) we have discussed an anaemia in lambs affected with parasitic gastritis and treated with phenothiazine; the evidence suggested that the anaemia was not due to the drug, although it was admitted that this had not been completely proved. As far as the leucocytic picture was concerned it was stated that the effect of phenothiazine, if any, was slight.

An experiment with phenothiazine instituted by the Agricultural Research Council and carried out at Moredun Institute by Dr. D. O. Morgan and Mr. J. E. N. Sloan provided an opportunity for studying the effect of phenothiazine on the blood-picture of sheep and of comparing results with those obtained in the paper referred to above.

History of the Flock.—A flock of 67 Cheviot lambs which had been grazed over a restricted area for a period of about four weeks in order to increase their worm-burden, was used for the experiment. At the end of this period the worm-egg counts averaged about 1,000 eggs per gramme of faeces, but all the lambs were clinically healthy.

Thirty-six of the lambs were then brought indoors and fed on concentrates and hay. The remainder were moved to "clean pasture" and were supplied with concentrates and hay in addition to the grass available. Before the first blood examination the lambs of the "inside group" were allowed seven days in which to become accustomed to dry food and new surroundings.

Serial bleedings of 16 selected lambs indoors were carried out in order to observe transitory or progressive blood changes. In addition, single bleedings of eight other lambs of the "indoor group," and of 31 lambs out-of-doors were carried out, at a time (three to four weeks later) when the findings of the previous investigation suggested that anaemic changes were likely to be apparent.

Technique. *Administration of Phenothiazine.*—Phenothiazine was supplied by Imperial Chemical Industries, Limited. The appropriate dose was given either as a draught of phenothiazine suspension, or in the form of 5 g. tablets of phenothiazine. A stomach-tube was used for administering doses of suspension containing an amount greater than 50 g.

Worm-egg Counts.—The technique described by Gordon and Whitlock (1939) was used for all worm-egg counts.

Haematology.—All estimations were made in the manner described

Table

		Serial Examinations on Inside Group										Outside Groups	Extra Inside Groups
Days after dosing		—6	—4	—1	1	2	4	6	13	20	27	34	21
Strongyle eggs*, hundreds per g. faeces	A	12	13	14				19	18	10	11	14	
	B	21	25	30				4	4	4	4	5	D 0
	C	14	13	16				1	0	0	0	2	E 0
Hb, g. per 100 ml.	A	12·3	10·7	9·5	9·0	8·2	8·1	9·3	9·6	10·1	10·5	12·1	
	B	11·8	9·1	8·7	8·4	7·8	7·9	6·9	9·0	9·5	10·7	12·0	D 11·2
	C	12·2	11·4	10·9	9·3	9·3	10·5	9·1	8·1	10·6	9·7	12·6	E 10·9
Red Count, mil. per 1 c.mm. ..	A	10·0	9·0	8·3			9·0	8·6	8·8	9·5	9·3	11·1	
	B	11·0	9·1	8·4			8·6	9·3	8·8	9·1	9·3	11·4	D 10·7
	C	11·2	10·7	10·2			9·0	9·7	8·4	8·5	8·5	11·1	E 11·4
Packed cell, volume per cent. ..	A	27	25	22			22	21	23	24	26	31	
	B	28	24	21			23	21	23	23	23	29	D 29
	C	27	25	26			26	23	25	24	24	31	E 28
Specific gravity, Aq. =1000 ..	A	1059	1054	1056			1047	1050	1046	1048	1049	1055	
	B	1056	1054	1055			1048	1048	1047	1047	1050	1056	D 1052
	C	1053	1053	1053			1050	1049	1045	1043	1050	1056	E 1052
Viscosity, Aq. =1	A	5·7	5·6	5·0			4·5	3·8	4·4	5·6	4·7	5·9	
	B	5·6	5·1	4·3			4·8	4·0	5·4	5·1	5·3	6·2	D 5·7
	C	5·2	5·1	5·5			5·1	4·4	6·0	5·5	4·9	6·5	E 5·1
Fragility, per cent. NaCl	A	0·52	0·52	0·52			0·52	0·55	0·55	0·52	0·55	0·55	
	B	0·52	0·50	0·47			0·52	0·52	0·52	0·52	0·55	0·55	D 0·55
	C	0·52	0·52	0·52			0·52	0·52	0·52	0·50	0·52	0·52	E 0·55
White count, Thous. per 1 c.mm...	A	10·6	7·2	7·3	9·4	8·4	10·5	8·3	9·8	9·0	8·9	10·3	
	B	10·1	6·5	5·4	7·9	8·5	8·3	7·5	8·8	8·8	7·5	9·1	D 8·9
	C	10·3	8·8	9·2	10·5	9·9	13·0	10·5	16·0	10·9	8·5	10·3	E 10·1
Band Forms, per cent.	A	1·0	0·2	0	1·0	0	1·2	1	2	1·5	5	1	
	B	0·5	0	0·2	0·2	2	0·5	3	3	3	1	1	D 2
	C	1·0	0·2	0·5	3	1	0·5	4	3	4	2	1	E 4
Polymorphs, per cent.	A	11	17	17	14	15	20	25	19	19	19	19	
	B	28	28	17	25	22	26	33	23	17	25	19	D 16
	C	27	30	29	33	26	31	29	35	27	31	20	E 23
Lymphocytes, per cent.	A	83	75	75	81	83	75	69	73	75	71	72	
	B	64	66	78	71	73	69	59	69	75	69	70	D 77
	C	82	61	79	76	87	76	75	74	80	87	71	E 69
Monocytes, per cent.	A	1	3	3	2	1	1	2	2	1	3	2	
	B	4	5	2	1	1	1	1	4	3	2	5	D 3
	C	4	2	4	1	1	3	4	2	3	2	3	E 1
Eosinophils, per cent.	A	3	4	3	1	1	2	2	2	2	1	3	
	B	2	1	2	2	2	2	2	1	1	2	5	D 2
	C	2	4	3	2	2	4	2	1	2	1	4	E 2
Basophils, per cent.	A	0·2	0	0·2	0·2	0	0·6	0·3	0·5	0·2	0·7	0·7	
	B	0·2	0·5	0·2	0·5	0	0·9	0·5	0·2	0·7	0·7	1	D 0
	C	0·4	0·8	0·4	0·5	0·4	1·0	0·2	0·8	0·5	0	0·7	E 0·2
Coagulation time. min.	A				2·5	2·5	3·0	1·5	2	2	1·5	2·0	
	B											2·0	D 2·0
	C	1·5	1·5	1·5	2·0	2·0	2·5	2·0	2·0	1·5	1·5	2·0	E 1·5

Composition of Groups:—

Inside Group
A. 4 lambs— 0 g.
B. 1 lamb — 5 g.
2 lambs— 10 g.
1 lamb — 20 g.
C. 2 lambs— 40 g.
2 „ — 80 g.
1 lamb —160 g.

Outside Groups
A. 7 lambs— 0 g.
B. 4 „ — 5 g.
4 „ —10 g.
4 „ —20 g.
C. 4 „ —30 g.
4 „ —40 g.
4 „ —50 g.

Extra Inside Groups
D. 4 lambs—30 g.
E. 4 „ —50 g.

* Excluding *Nematodirus* sp.

in our paper mentioned above. Haemoglobin was determined by a Zeiss Ikon haemometer, viscosity by a Denning Watson tube, and fragility was measured by recording maximum haemolysis in sodium chloride solutions varying by 0·05 per cent. Coagulation time was determined by a capillary tube method in the manner described by Stewart and Holman (1940). Oxalated blood was used for all estimations except coagulation time.

Experiment.—The lambs of the "inside group" selected for serial bleedings were: (*a*) Four control animals which received no phenothiazine. (*b*) Two animals at each of the following doses: 5 g., 10 g., 20 g., 40 g., 80 g., and 160 g. of phenothiazine in suspension.

Eight other lambs of the "inside group" were bled once, 24 days after treatment with phenothiazine. Two of these animals had each received 30 g. of the drug in tablet form, two, 30 g. in suspension, two 50 g. in tablet form, and two 50 g. in suspension.

The 31 "outside lambs" were bled once, 34 days after treatment. The amounts of phenothiazine administered to these animals are detailed in Table.

Results

The results, shown in Table (*see p. 215*), have been summarised in order to present them in the least possible space.

Inspection of the complete haematological data, and of their summarised form as presented in the table does not reveal any significant difference between the blood-pictures of control and treated animals.

Discussion

When the lambs were first brought indoors it was noted that, for a longer or shorter period, every animal refused to eat dry food. Weighings carried out at this time indicated a steady loss of weight. It has been stated that seven days elapsed before the first bleeding was carried out, but even at this time few of the lambs were feeding properly. This lack of appetite and general physiological upset is reflected in the blood-picture of all the animals during the three preliminary bleedings and for two days after treatment. Thereafter the condition of both control and treated animals slowly improved.

This sudden change of environment, however, affected some lambs more severely than others. It soon became apparent that of the 16 lambs selected for bleeding, three were not thriving at all; they showed marked lack of appetite, were listless, and weak. The doses of phenothiazine which had been administered to these three lambs were 5 g., 20 g., and 160 g. respectively. The animal which had received 20 g. of phenothiazine died 15 days after treatment, and *post-mortem* examination revealed nodular liver necrosis together with liver-fluke infestation. The 5 g. dose animal was slaughtered 31 days after treatment and nodular liver necrosis was found, but there was no evidence of fascioliasis. The third of these three animals (that which had received 160 g.) was slaughtered 48 days after treatment and was found to be heavily infested with *Fasciola hepatica* and *Dictyocaulus filaria*. Therefore, because the experiment was concerned only with the effect of phenothiazine, these animals were discarded.

Besides the lack of appetite which has been ascribed to the sudden transition from life in the open to confinement in a loose-box, it was noted that those lambs which received the 80 g. and 160 g. doses ate practically nothing for about three days after administration of the drug. This has been accepted by us as an explanation of the somewhat lower figures for red cell counts which were apparent in the individual records in these animals.

In our previous paper it was stated that blood changes possibly attributable to phenothiazine were slight. In the case of one animal which received two doses of phenothiazine, the first administration was followed by a neutrophilia, and the second administration by a neutrophilic shift to the left. A slight progressive decrease in neutrophils was noted in the treated group.

In the present experiment, however, no neutrophilia was noted, and the possible significance of an increase of band forms suggested by the records of individual lambs of the "inside group" was nullified by differential counts made on animals of the "outside group."

Summary

The therapeutic dose of phenothiazine for lambs is regarded as being between 10 g. and 20 g.; no specific change was detected in the blood of 25 lambs receiving more than this dose.

Acknowledgment.—We are grateful to Dr. J. Russell Greig for his continued interest in this experiment.

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CLINICAL COMMUNICATION

Parasitic Aneurysm of the Renal Arteries of the Horse*

C. W. Ottaway and Myra L. Bingham
Royal Veterinary College

Members may remember that last year we had the honour of presenting a paper[1] to this Society in which we gave a short report of our findings of parasitic aneurysm in the horse. Since then we have been continuing our investigations and we came across an interesting specimen the other day which we have brought to the meeting.

It is the intra-renal portion of both renal arteries from an 18-months-old New Forest pony mare, showing invasion with strongyle larvae. The degree of infestation has not been determined as we wished to keep the specimen intact until after the

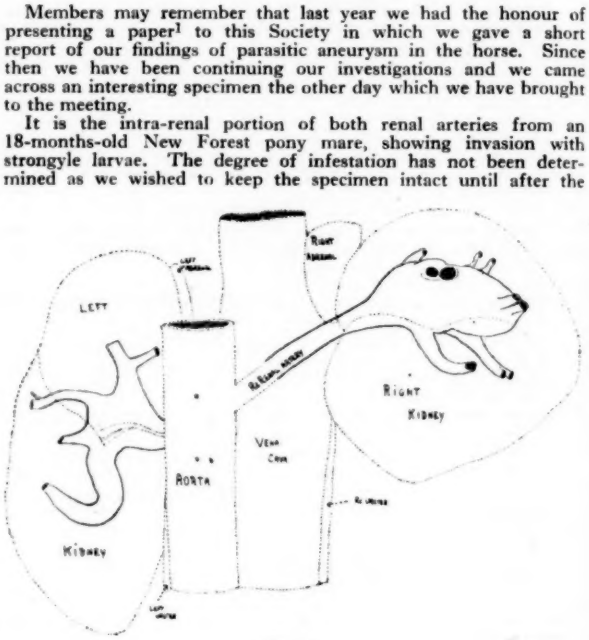

Fig. 1

Fig. 2

Fig. I.—Diagram indicating the relation of the aneurysms to surrounding structures.—Dorsal view.

Fig. II.—The dissected specimens. The adjacent portions of the posterior vena cava and aorta are represented by sticks.—Dorsal view.

*Communicated to the meeting of the Central Veterinary Society held at the Conway Hall, Red Lion Square, W.C.1, on March 5th, 1942.

meeting†, but one larva can be seen projecting from the cut end of a branch of the right renal artery.

The animal was in poor condition and other points noted on *ante-* and *post-mortem* examination were as follows:—

Rectal Examination (*Structures Palpated*).—Uterus, ovaries, kidneys, aneurysm root of anterior mesenteric artery. No evidence of the aneurysm exhibited was noted.

Faecal Examination.—Very low count—only 630 eggs per gramme of faeces.

Dissection Findings.—(*a*) Alimentary: Practically no adult parasites in the intestines; 267 *Gastrophilus intestinalis*, 96 *Gastrophilus veterinus*, and 23 immature gastrophilus larvae in stomach and first part of duodenum.

(*b*) Peritoneal: No evidence of *S. edentatus* larvae, fibrinous deposits on abdominal wall.

(*c*) Arterial (*aneurysms*): Root of coeliac axis and anterior mesenteric, hepatic, splenic, right and middle branches of a.m., aorta dilated with evidence of aneurysm from coeliac to a.m. root and a saccular aneurysm at level of a.m. root. Calcification, thickening and thrombus formation at root, and in right branch of, a.m. [intra-renal portions of both renal arteries.]

Macroscopic Changes.—Heart, liver and kidneys enlarged. Mesenteric and colic lymph nodes enlarged. Pressure on origin of small colon, pancreas, adrenals, kidneys and nerve ganglia.

Situation and Diagnosis of Parasites.—*Strongylus vulgaris* in aneurysms of a.m root (7.) right branch a.m. (5.) middle branch a.m. (3.) hepatic art. (9.) aorta (15.)

The marked venous congestion throughout the body can probably be attributed to the tissue adhesions and pressure produced by these growths.

We are not prepared to discuss the significance of this aneurysm, although both the site and size are rather remarkable. Some authors have suggested that if the strongyle larvae were carried by the arterial blood by way of the heart to the branches of the anterior mesenteric artery, their usual site, it would seem that the young parasites should locate in the coeliac and renal arteries also. It is worthy of note that in this horse separate aneurysms were found, not only at the anterior mesenteric, but also at the coeliac, renals and other smaller arteries. This fact might lend some support to the theory of arterial migration.

REFERENCE

OTTAWAY, C. W. & BINGHAM, MYRA L. "Some Records of Parasitic Aneurysm in Clinically Affected Horses." *Vet. Rec.*, **53**, 275-282.

†Since this case has been reported the specimens have been examined. The increase in size in both arteries was due to dilatation without thickening of the arterial wall, but with thrombus formation; 15 larvae were recovered from the right artery but none from the left. As both arteries showed evidence of aneurysm the absence of larvae in the left artery indicates that they had passed on into smaller vessels within the kidney tissue.

DISCUSSION

Dr. TOM HARE stated that he had mounted several specimens for the Pathology Museum of the Royal Veterinary College showing infarction of the horse's jejunum and ileum, resulting from arteritis of the branches of the anterior mesenteric artery owing to the action of the strongyle larvae. Infarction of the intestine produced acute colic, and repeated infarctions accounted for many cases of recurrent colic. An infarct might ulcerate and perforate, leading to a fatal peritonitis; or it might heal forming a dense fibrous ring encircling the gut; or it might heal as a nodular or fusiform-shaped cellular granuloma which gave rise to the mistaken diagnosis of multiple sarcomatous growths in the wall of the intestine. He had seen as many as eight of these large granulomata resulting from an infarction from which the horse had recovered months previously. It was a great help from the medico-legal point of view that, after the sudden deaths of horses, the *post-mortem* examination should establish the results of previous larval migrations via the arteries. He hoped Mr. Ottaway would go forward with his important investigations. We needed more precise information on the distribution of lesions via arteries other than those to the intestines, heart and lung; the specimens shown by Mr. Ottaway of lesions in the renal arteries were an advance. He also wished to emphasise the importance of having faeces examined for strongyles in all cases of sudden pain in horses.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT, 1937 (PART IV)

Summary of Returns of Confirmed Outbreaks of Scheduled (Notifiable) Diseases

Period	Anthrax	Foot-and-mouth	Parasitic Mange*	Sheep Scab	Swine Fever
April 1st to 15th, 1942	14	—	3	7	13
Corresponding period in—					
1941 ...	27	19	1	7	45
1940 ...	23	2	1	10	206
1939 ...	42	—	2	1	67
Total Jan. 1st to Apr. 15, 1942	95	11	26	98	123
Corresponding period in—					
1941 ...	163	195	7	99	599
1940 ...	283	17	11	101	1,126
1939 ...	304	29	21	140	405

NOTE.—The figures for the current year are approximate only.
* Excluding outbreaks in Army Horses.

ABSTRACTS

[SWINE INFLUENZA ASSOCIATED WITH HOG CHOLERA. SCOTT, J. P. (1941.) *Penn. Bul. Vet. Ext. Quart.* **41**. No. 26.]

Pneumonia developed in a herd of 102 pigs four months after immunisation against swine fever. Swine fever lesions were found in two pigs and the remainder were treated with serum, but during the next two weeks 20 animals died. Influenza virus was isolated by mouse passage and chick embryo inoculation from the lungs of one pig sent for *post-mortem* examination.

It was subsequently shown that swine fever virus preparations are often contaminated with influenza virus and that swine fever serum often contains influenza antibodies. The course of the combined infections may be very rapid, with death in five to nine days. The influenza virus is present in the blood-stream in the combined infection, but not in a pure influenza infection.

Pigs are easily immunised against influenza with formalised virus so that when subsequently inoculated with swine fever virus they do not develop lesions of influenza, but pigs improperly immunised against swine fever will develop this disease when infected with influenza.

[The subject is of great importance in swine fever work, but this record contains a great deal of detail difficult to abstract adequately.] G. S.

* * * * *

[CLINICAL OBSERVATIONS ON NUPERCAINAL AS A LOCAL ANAESTHETIC. BRYAN, A. H. (1941.) *N. Amer. Vet.* **22**. 749-750.]

Nupercainal is a 1 per cent. *a*-butyloxycinchonic acid diethylethylenediamide in a petroleum-lanolin base, supplied by Ciba Pharmaceutical Products.

It is an ointment for topical application only. It has no anaesthetic action on the unbroken skin.

The author describes twelve cases in which the preparation was found to be useful.

Its application is indicated mainly for the dressing and suturing of wounds, burns, operations about the eye, and mucous membranes generally. C. F.

* * * * *

[THE ROLE OF ONE SPECIES OF COCKROACH AND SEVERAL SPECIES OF FLIES IN THE DISSEMINATION OF BRUCELLA. RUHLAND, H. H., and HUDDLESON, I. F. (1941.) *Amer. J. vet. Res.* **2**. 371.]

The appearance of Brucella infection in clean self-contained herds is commonly inexplicable. The article is a record of work done in an effort to incriminate in the spread of the disease the following insects: the common cockroach, *Periplaneta americana*, and the flies *Musca domestica* L., *Muscina stabulans* F., *Stomoxys calcitrans* L., Calliphora and Lucilia.

The insects were fed upon cultures of *Br. abortus* and cultures were prepared after varying intervals from the intestinal contents.

Brucella was not recovered from the cockroaches after 24 hours, and the authors conclude, therefore, that they cannot be regarded as important carriers of the disease.

No cultures were prepared from flies more than 96 hours after infection, when *Br. abortus* was regularly isolated, but it is possible that they may carry the infection for a considerably longer time.

It follows that flies must be considered as one of the possible means of transmission of Brucella infections to animals and man. A. W. T.

QUESTIONS IN PARLIAMENT

Control of the Artificial Insemination of Livestock

Prior to the Whitsuntide recess, in the House of Commons on Thursday of last week, Mr. T. SMITH asked the Minister of Agriculture whether, in view of the harm likely to be caused to the livestock industry of this country by the improper or indiscriminate use of artificial insemination, he will take the necessary steps to ensure that this practice is properly controlled?

Mr. HUDSON: Yes, Sir. The Agricultural Improvement Council, which, as my hon. Friend is no doubt aware, recently appointed a committee for the purpose of supervising the initiation and conduct of two large-scale field trials in artificial insemination at Cambridge and Reading, have expressed the view that in order to avoid jeopardising the successful establishment of this practice, steps should be taken to prevent its indiscriminate commercial exploitation. I accordingly propose to ask Parliament at the first convenient opportunity for powers enabling me, in the interests of the livestock industry, to control the practice of artificial insemination by specifying the conditions under which it may be employed and by restricting its use to properly authorised persons in all cases, except where the animals to be inseminated are in the same ownership as the animals providing the semen.

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

June 2nd.—R.C.V.S. Committee and Council Meetings, York.
June 2nd.—Meeting of the Lancashire Division, N.V.M.A., at Chester, 2.30 p.m.
June 3rd.—R.C.V.S. Annual General Meeting. Committee and Council Meetings, Royal Station Hotel, York.
Victoria Veterinary Benevolent Fund Annual Meeting, York.
June 4th.—Meeting of the Central Veterinary Society at the Conway Hall, Red Lion Square, W.C.1, 2.30 p.m.
June 5th.—D.V.S.M. Written Examination commences, Edinburgh.
June 9th.—D.V.S.M. Oral and Practical Examinations begin.
June 10th.—Meeting of the Scottish Metropolitan Division, N.V.M.A., at Dundee, 2 p.m.
June 19th.—Meeting of the North Wales Division, N.V.M.A., at Llandudno, 2 p.m.
June 25th.—R.C.V.S. Written Examinations begin.
June 29th.—R.C.V.S. Oral and Practical Examinations begin.

* * * * *

R.C.V.S. Annual General Meeting

The annual general meeting of members of the R.C.V.S. will, as already announced, be held at 12 noon on Wednesday, June 3rd, at the Royal Station Hotel, York. The only business will be to receive the report of the election in Eire of a representative of Eire on the Council, and the adoption of the annual report. The holding of an election of Council has been suspended under the powers conferred by the Chartered and Other Bodies (Temporary Provisions) Act.

Owing to the paper shortage it has been impossible to supply all members of the College with a copy of the annual report, and for the same reason the report has been reduced to the barest summary of the reports of Council which have been published in *The Veterinary Record*. Any member who specially desires to be supplied with a copy of the annual report should make application to the Secretary, R.C.V.S., 18, Victoria Avenue, Harrogate.

* * * * *

Control of Diseases of Dairy Cattle in Scotland

The following appears in the current issue of *Farming News and North British Agriculturist*: "Branches (of the National Farmers' Union of Scotland) have been asked to send forward observations on proposals for the introduction in Scotland of a Scheme for the Control of the Diseases of Dairy Cattle. There is much to commend this scheme to farmers, for through it they are entitled to the advantages of free laboratory facilities, free anti-abortion vaccine and sulphanilamide at reduced cost. These three services are to be placed at the disposal of farmers participating in the scheme by the Ministry of Agriculture, who are, of course, responsible for the control of animal diseases throughout Great Britain.

"The whole matter is shortly to be the subject of a conference between representatives of the War Committee and delegates from the Highland and Agricultural Society and the Milk Boards. Once final details have been adjusted, it is hoped that the conditions will meet with the acceptance of farmers generally."

* * * * *

Refresher Tuition in Bovine Pregnancy Diagnosis and Treatment for Infertility.

Further to our announcement of May 9th, Mr. J. N. Bowen is commencing the Refresher Tuition Course in Oxfordshire, Gloucestershire and Buckinghamshire districts. Members wishing to participate who have not already notified the General Secretary can still be included if they send their names, without delay, to the N.V.M.A., 10, Bore Street, Lichfield.

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Benevolence

Further donations received in response to the appeal made by the officers of the N.V.M.A.:—

	£	s.	d.
Already acknowledged (*The Veterinary Record*, Dec. 20th, 1941)	1,082	13	6
Midland Counties Division	17	5	0
Central Division (second contribution)	25	0	0
	£1,124	18	6

Association Correspondence

As from Tuesday next, all correspondence for the General Secretary, N.V.M.A., also for the Editorial Representative, should be addressed to No. 36, Gordon Square, London, W.C.1.

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PERSONAL

Births.—At Dewsbury on May 15th, 1942, to Nancy, wife of James Marshall, M.R.C.V.S., a son.

On May 21st, at Hammersmith Hospital, to Ruth (*née* Teverson, M.R.C.V.S.), wife of Bryan F. V. Hussey, a son, Christopher Michael.

* * * * *

R.C.V.S. OBITUARY

Stokes, Thomas Frederick, Inspector, Ministry of Agriculture. Graduated London, September 12th, 1934. Died at Cheshire Sanatorium May 11th, 1942.

The Late Mr. T. F. Stokes, M.R.C.V.S., D.V.S.M.

The death of Mr. Thomas Stokes at an early age is indeed a grievous event, depriving the Ministry's staff of one of its most able and promising young men, while he had been married only five months. The deepest sympathy is extended to the widow, to the bereaved parents and the two sisters.

After matriculating from Oswestry Grammar School he entered, in 1930, the Royal Veterinary College, London, where he had a brilliant career, winning the Williams Memorial prize and the FitzWygram prize in 1934 when he obtained his M.R.C.V.S. diploma with honours. He went on from London to the Royal (Dick) Veterinary College, Edinburgh, and studied for the diploma in Veterinary State Medicine, which he obtained in 1935. Mr. Stokes then entered general practice as assistant to Mr. H. Tudor Hughes, of Oswestry. "His sterling work and ability were promptly recognised and appreciated in this district," says *The Border Counties Advertiser*, "and he became widely known and highly esteemed both for his fine character and his professional ability. His departure from Oswestry in 1938 was generally regretted." He left to take up an appointment as a veterinary inspector in the Animal Health Division of the Ministry of Agriculture and Fisheries, being posted to the West Riding Division of Yorkshire, at Wakefield, and there he was actively engaged until illness overtook him in the summer of 1941.

Among the general mourners at the funeral of Trefonen, which was attended by a large company, were Mr. R. Hughes, Oswestry, Mr. H. Tudor Hughes, Willow Street, Oswestry, Mr. R. S. Kyle, Ministry of Agriculture, Welshpool, Mr. G. McKee, Ministry of Agriculture and Fisheries (representing the Association of Veterinary Inspectors, Ministry of Agriculture and Fisheries), and Mr. T. J. Tyrrell, Ministry of Agriculture and Fisheries (representing the West Riding Division of the Ministry of Agriculture and Fisheries, and the Yorkshire Branch of the National Veterinary Medical Association).

* * * * *

NATION'S NEED OF MORE MILK

Mr. Hudson, Minister of Agriculture, presiding at an address given to the Royal Society of Arts, in London, by Professor H. D. Kay, of Reading University, on "The future of milk production," said that strenuous efforts were being made not only to get milk supplies back to their peace-time level, but even to improve on that level. The problem of maintaining milk production in war-time had given him more concern than any other department of his Ministry. He hoped the efforts now being made would lay the foundation of an efficient dairying industry which would play a vital part in a healthy and well-balanced agriculture after the war. Arable dairying must predominate in the future.

The Minister said that 60 per cent. of British dairy farmers had 14 cows or fewer: 10,000 had fewer than four; 30,000 from five to nine; 25,000 from 10 to 14. All these farmers between them had 500,000 dairy cows and the other 40 per cent. 1,500,000. Three-quarters of all producer-retailers sold less than 10 gallons a day: 30 per cent. less than one gallon; another 30 per cent. less than five gallons; and 14 per cent. less than 10 gallons.

"Chartered Dairy Farmers"

Professor Kay estimated the present average yield of milk per cow at 460 gallons a year, against 520 to 550 gallons before the war. By progressive methods it could be raised in a decade to 700 or 750 gallons. He visualised the coming of "chartered dairy farmers"—men who would have to show certain standards of professional competence before they would be allowed to use land.

Other proposals for a post-war milk policy were outlined by Professor Kay, as follows: milk must be regarded as the "keystone of the arch of national nutrition" and much greater quantities of

it will be required; continuation of central control of dairy farming (as under the W.A.E.C.s at present), with specific "targets"; general increase in efficiency and competence in processing and distribution, licences to distribute being conditional on such efficiency; a unifying and consolidated Act of Parliament to cover the whole milk and dairying industry and provide for satisfactory administration over the whole country.

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R.C.V.S. ANIMAL MANAGEMENT EXAMINATION

List of Successful Candidates

(*Continued from page 209*)

Liverpool:

Arthur, T. H.	Johnston, R. M.
Ash, Miss D. M. M. (credit)	Jones, K. W. R.
Egginton, Miss D. N. (credit)	Kidd, John
Evans, J. R.	Overton, G. C.
Evans, S. D. S.	Penny, R. H. C. (credit)
Forrest, Eric	Robinson, F. E.
Hull, Peter N.	Whitfield, G. D.

Glasgow:

Barr, W. A. B.	Mackenzie, Miss C.
Campbell, Donald	Mackenzie, Miss J. (credit)
Frew, Iain	Murdoch, W. A. (credit)
Galbraith, Miss M. C.	Nimmo, I. S.
Lapraik, R. D.	Provan, J. W.
Locke, Hugh	Ross, Hugh
McDonald, Andrew	Sullivan, Jerome
McDonald, A. W.	Thomson, Wm.
Macdonald, D. K.	Weissberg, E.
McEwan, J. W.	Wilson, Miss J. M.
McGregor, J. L.	

Edinburgh:

Archer, Dennis	Rimmer, S. M.
Hill, R. L.	Roe, D. M.
Langridge, R. N. T.	Wallace, R. J. L.
McKee, F. A.	Wildbore, J. G. S.
Newlands, T. B.	

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Monday morning for insertion in following Saturday's issue.
The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

* * * * *

MEAT INSPECTION

Sir,—At the present time it is pertinent to ask whether meat inspection in this country is carried out with due responsibility and knowledge by all meat inspectors in order that no food be wasted which might be rendered fit for human consumption.

It is unfortunate that no statistics are published to assess that which is condemned at different centres of slaughter. Local authorities, up and down the country, have approved inspectors for meat inspection, who frequently have a multitude of other duties to perform, but who are probably devoting as much time and thought to this work as possible.

The Ministry of Food have several veterinary inspectors acting in an advisory capacity, but one wonders if the public can really be assured that our meat inspection to-day, when meat is scarce and we are at war, is being carried out with all possible care and responsibility, so as to ensure that no food is unnecessarily condemned and wasted, or that inferior meat is given satisfactory supervision.

During the last war, I was Veterinary Surgeon and Meat Inspector to the Burgh of Hamilton. Owing to the scarcity and soaring prices of all butchers' meat at that time, I presented a scheme to my committee pointing out that certain meat which was being condemned could be made use of for human food if sterilised. The committee with commendable judgment and patriotism at once agreed to my proposition, and suitable premises were fitted with up-to-date appliances for the sterilisation of this meat.

I was given discretionary powers to decide what meat should be utilised and the form in which it should be put on the market.

The scheme was highly successful, and the Scottish Local Government Board, after a very careful enquiry into our system, thought so much of it that they issued a new statutory order legalising the use of this meat and our method of treating it.

I used a similar method to the Freibank system which has been in operation in Germany since the thirteenth century, and decided to sterilise the muscular tissue of carcases affected with localised tuberculosis, which would otherwise have been destroyed under the standard in vogue. All diseased and in-contact meat was removed and destroyed, and the selected portion of the carcase was sterilised for a sufficient length of time to render it perfectly safe for human food.

Tuberculous disease of the musculature is rarely seen in our food animals, and I adopted the cooking of this meat simply to ensure that any possibly tuberculous lymphatic gland that might be lying between the bundles of muscular tissue was rendered harmless.

Many tons of excellent edible food were prepared and disposed of at our factory to *all classes* of the community in the form of potted meats, potted tripe, tongues, boiled beef hams, spiced beef, dripping, etc. During the whole time that the factory was in operation we never received a complaint of any kind, but were the recipients of many letters of congratulation and appreciation from purchasers of our products.

The various foods were regularly submitted for examination to several bacteriologists, but always with negative results.

Needless to say, there was a large number of people who objected to the use of the Freibank system in this country, but I would simply point out that people are more likely to suffer from defective nutrition than any possible harm from eating this food, and there was no obligation laid on anyone to purchase meat at the Freibank.

The best argument in favour of this institution is the control and supervision of the Public Authority which it entails, and also its popularity in the countries where it is in use. The system is of course more satisfactorily conducted when a universal standard of inspection is in vogue. Unfortunately we have no definite standard—the lack of which is an absolute disgrace to our country—and although the Ministry of Health have from time to time issued recommendations *re* meat inspection, they are not compulsory. Consequently very few inspectors alter their methods of inspection and treat these suggestions with indifference.

All the leading authorities on this subject are whole-heartedly in favour of a definite universal standard, yet in spite of many representations to the responsible Government department, the ancient and out-of-date system is still with us.

As much meat as possible is probably being saved by allowing a low standard and each inspector to use his own, and also by diverting certain meat into manufacturing channels without any guarantee of adequate sterilisation. On the other hand, the inspector may condemn meat either from lack of assurance of its destiny or method of its sterilisation, or, which is more probable, his own lack of experience and knowledge makes him err for safety.

I would suggest, as a war-time measure at any rate:—

1. A scheme for the sterilisation of certain qualities of meat on similar lines to the Freibank system.

2. A State Meat Inspection Service, working to a definite standard as far as possible to ensure uniformity, this service to supervise all subsequent processes dealing with inferior quality meat, to make certain that no meat which might be sterilised is wasted.

Yours faithfully,

D. Hamilton.

Edgerton House,
34, East Parade,
Harrogate.
May 18th, 1942.

* * * * *

BOVINE INFERTILITY

Sir,—I did not intend to enter this arena, but in view of the recent contributions of Messrs. Smythe and Brown I cannot refrain. May I make it quite clear that I did not expect unanimity with regard to the value of the work of the Survey Committee, especially in respect of the scheme which the Association has agreed, but I did hope that criticism would be helpful and constructive. It is so easy and yet so futile to offer destructive criticism.

It certainly came as a surprise to me to learn the reason of Mr. Smythe's failure to fulfil his obligations as a member of the Survey Committee. Mr. Smythe was invited to the first full meeting of the Survey Committee on August 16th, 1940. At that time he was in possession of all the evidence and draft recommendations with regard to the control of mastitis, abortion and infertility. For his absence from this meeting Mr. Smythe sent an apology. Between that date and December 31st, 1940, when the report was unanimously accepted by Council and the draft scheme unanimously accepted as a basis for discussion with other bodies, Mr. Smythe received invitations to all other full meetings of the Survey Committee and he was supplied with all the relevant material. He sent no comment or criticism on the Committee's report of proposals and yet I believe Mr. Smythe was well enough to examine for the Council of the R.C.V.S. in December, 1940.

Altogether, Mr. Smythe has been invited to nine meetings of the Committee, he has attended none and has sent one apology for absence. His sole contribution to the Committee's activities has been two letters in the columns of *The Veterinary Record*. How much more useful might Mr. Smythe's criticisms have been during

the latter half of 1940. I have no quarrel with Mr. Smythe for his criticism, but I could wish that he and other members of the Survey Committee who had reason to criticise the activities of that Committee would have done so, at any rate in the first place, to the Committee itself. I happen to be the individual who nominated Mr. Smythe to the Comittee and I would have valued the co-operation of a clinician whose ability is beyond reproach.

At one of the meetings which we held with the Agricultural Research Council to discuss technical measures to be employed in the scheme, Sir Joseph Barcroft made an observation in the following sense: "We are at war; when one is at war one has to take risks and adopt measures which one might not be disposed to take so readily in time of peace, but if we are satisfied that the risks are worth taking, we should take them boldly." This is a lead which I think we should follow. There are still too many in this country and within this profession who fail to realise the gravity of the present situation. I, for one, am satisfied that the risks which we as a profession are taking in connection with the scheme are well worth while.

This goes also for Mr. Smythe's warning concerning "the risk of widespread injury being caused by half-trained practitioners, previously totally unfamiliar with the class of work which they will suddenly be called upon to perform"; I agree with him that "neither safety nor experience can be derived from a few lessons, however capable the instructor."

Nevertheless, whilst "gadding round the country like a salvation army lassie"—"staying at first-class hotels" (I have never been able to reconcile these two accusations!) I have received evidence in abundance from members whom I and my colleagues have had the privilege of assisting, that that assistance has been invaluable. I have been impressed by the willingness, nay anxiety, of practitioners to make themselves proficient and have been moved by their gratitude. In connection with the technical measures involved it is obvious that experience is the master of proficiency, but it is impossible to acquire either experience or proficiency without trial—and error! At the same time, if one never attempted the difficult, nothing would ever become easy. I have often penetrated the uterus with the catheter, but as I have never injected into the uterus without a controlling hand in the rectum no harm has resulted. I never express a corpus luteum without some good reason, but I have yet to experience my first case of death due to haemorrhage following this operation. Perhaps one day I shall be unfortunate but that will not deter me. It is inevitable in the course of veterinary practice that occasionally one performs operations—even minor ones—which result in the death of the animal, but this does not deter one from operating.

We have never suggested that in the technical measures recommended for the control of the diseases in question the last word had been spoken, but by careful and intelligent application these measures will, with the co-operation and goodwill of the stock-owner, reduce the wastage and so contribute materially to the increase of our milk supply.

We have freely admitted that the scheme is not perfect and that it will be amended and modified in the light of experience; it is, however, a beginning and it represents the acceptance by the profession of our obligations to agriculture and to the country; it is an attempt to merit the complete reservation which has been placed upon us. *All that we have promised or undertaken to do is—our best*: no one can do more, but let us be sure we do no less.

In view of the simple truth of the above statements I find it difficult to understand the refusal of certain members of the profession to participate in the scheme on the grounds that "they were not yet in a position to give efficient service where these diseases were concerned." I can, of course, appreciate other grounds for refusal, some worthy, some not so worthy.

Yours faithfully,

H. W. Steele-Bodger.

28, Lichfield Street,
Tamworth,
Staffordshire.

May 25th, 1942.

* * * * *

Sir,—I must express my regret that I did not connect the opportunity afforded me of acting as examiner in surgery in July, 1941, on account of Mr. Smythe's unfortunate temporary breakdown in health with his inability to collaborate in the work of the Survey Committee of which he accepted membership.

The work of that Committee on which the report was based was carried out between May and December, 1940, and the report and draft scheme presented to Council in December of that year.

The recommendations on infertility, mastitis, contagious abortion and Johne's disease were not intended by the Committee to be the last word: any advance in research or in the field that may be available to-day or becomes available in the future would be welcomed by the whole of the profession—including the members of the Survey Committee.

The treatment recommended for infertility due to infection has been in vogue since introduced by Neilsen nearly twenty years ago and in the hands of many practitioners has proved a safe and highly successful measure. "Complete" knowledge—so earnestly desired by all, including Mr. Smythe—may or may not be available in another twenty years. Are we to do nothing in the meantime?

The report points out the types of infertility met with in bovines and gives guidance on diagnosis and treatment, but it was never claimed to be a thesis on this very wide subject.

The attention of the profession is drawn to the *absolute* necessity for skill in pregnancy diagnosis to be achieved before treatment is undertaken. Similar emphasis is laid upon the need for rectal exploration to determine that the catheter is in the correct position in the uterus before the antiseptic fluid is injected.

The risk of death from ovarian haemorrhage after enucleation of the corpus luteum is pointed out and assessed at its true significance, namely, that it may occur but that the risk is very very small. In my own experience I have met two cases, confirmed *post-mortem*, in some 10,000 cases treated. Mr. Smythe's letter simply reiterates warnings already given by the Survey Committee itself. It would indeed be inexplicable to me if some degree of haemorrhage did not occur *every* time a corpus luteum is expressed—is this such a revelation as Mr. Smythe seems to imagine?

It has never been suggested that refresher tuition does more than establish initial confidence and give guidance to inexperienced practitioners. It is common sense to suggest that any inexperienced veterinary surgeon should make every effort to become skilled after such initial tuition by repeated practice, taking notice of the precautions advised. How else is he to become skilled?

Mr. Smythe admits that he agrees that the work of the Survey Committee on infertility constitutes the most valuable part of its programme—although he does not wholly agree with it. That is indeed a stepping stone to further possible agreement. Can we now have his "warnings" regarding the recommendations on mastitis, Johne's disease and contagious abortion?

Yours faithfully,

Geo. N. Gould, jun.

"Rockholme,"
12, Landguard Road,
Southampton.

May 18th, 1942.

* * * * *

Sir,—In *The Veterinary Record* of May 16th, in connection with the control of certain diseases of dairy cows, under the heading "What the Veterinary Surgeon should do," appears the following: "Pay such other visits and carry out such treatment as may be necessary for the control and prevention of infertility." In the same number of *The Veterinary Record* there is a report of a meeting held at the Farmers' Club, Whitehall, S.W.1. At that meeting the Chairman of the Survey Committee, N.V.M.A., is credited, when referring to certain biological products, with the statement "that they could not be utilised within the scheme; they must either be provided as an extra and paid for by the farmer, or they must be provided by the Government, possibly at a reduced price."

It is a timely warning, but where do we stand now, if, for a certain price, we sign a contract to carry out "such treatment as may be necessary?"

Assuming that retention of foetal membranes may lead to sterility, it would be reasonable for a farmer to expect these to be removed by the veterinary surgeon within the terms of the contract. If the Survey Committee attaches importance to retention of foetal membranes in this respect, it is fair to think that the annually decreasing contract price is intended to cover this work.

Yours faithfully,

S. J. Motton.

Penzance.

May 20th, 1942.

* * * * *

Enucleation of the Corpus Luteum

Sir,—The enucleation of the corpus luteum is not pernicious when performed correctly and confined to those cases where it is indicated. It becomes dangerous if practised as a routine in each and every case of infertility.

The operation can hardly be described as a "pinching" process, for it is more in the nature of a rolling one between thumb and finger to "loosen up" the retained body, combined with very slight pressure. When completed, the impression gained is as if a bean or a pea had shot out.

In the course of an article to *The Veterinary Journal* in 1933, it was emphasised that a careful enquiry into the breeding history of the animal presented for examination would assist in forming a diagnosis, and the present problem is no departure from what should be a universal rule.

In the case of a healthy cow with a normal history and whose sole symptom has been the absence of oestrus within sixty to ninety days of her last calving, it is logical to enucleate a corpus luteum, if present, in the absence of evidence which may render it undesirable to do so. The fundamental cause must be established.

The most difficult cases are those where abortion has occurred early and as so frequently happens, has passed unnoticed. Such cattle, if examined soon after the event, will in the majority of cases present corpora lutea in their ovaries, and the decision whether these should be left alone or disturbed must be guided by conditions prevailing elsewhere, for they represent *an interrupted pregnancy* and *not a delayed or a deranged oestrous cycle.*

A certain amount of haemorrhage is bound to follow the enucleation of any corpora lutea, and the extent is to a degree dependent on the size of the corpus luteum enucleated: the pressure exercised: if near or remote from an oestral period, and other factors, two of which Mr. Smythe has mentioned.

The risk of fatal haemorrhage has in my experience been very slight, and I am inclined to think that in such cases the real explanation is to be found in a profound shock which has destroyed the vaso-motor control of the utero-ovarian and uterine arteries. Such a case is described by Udall and Williams in *The Cornell Veterinarian* (1931), vol. xxi, p. 295, and is alluded to in the second edition of "The Diseases of the Genital Organs of Domestic Animals" by Williams, published at Ithaca, N.Y., in 1939.

Yours faithfully,

"Rothiemurchus," J. F. D. Tutt.
St. Cross,
Winchester.
May 18th, 1942.

* * * * *

THE PROFESSION AND PUBLICITY

Sir,—My attention has been drawn to a letter which appeared in your issue of April 25th, over the signature of H. W. Steele-Bodger, in support of a National Veterinary Scheme for farmers. The writer, in making comparison between the advertisements which appear in the South African *Farmers' Weekly* and the *Farmers' Weekly* published in this country, endeavours to explain the reason for this. His attempt to do so is both inaccurate and misleading.

Mr. Steele-Bodger, quite obviously, has very little personal knowledge of the conditions prevailing in South Africa. In the first place, the South African *Farmers' Weekly* has a circulation limited to the English-speaking farmers of the Union, who are in the minority. The Afrikaans farming papers have a much bigger circulation and are more widely read. The value of Press advertising, which in South Africa is fairly costly, is chiefly determined by circulation.

Secondly, veterinary preparations are largely sold through the medium of the store keeper, who occupies a unique position in the rural economy of South Africa—quite unlike anything there is in this country.

Thirdly, the majority of the cattle are kept under something akin to ranching conditions, and as they are relatively low in value, trouble is not largely taken to treat them, except to keep the tick in check and prevent epidemics of tick-borne diseases. There is nothing like the density of cattle population that there is in this country, with its higher incidence of disease, nor is there anything approaching our highly specialised and heavily stocked farms.

The paucity of advertisements in the South African *Farmers' Weekly* is not, therefore, due to the fact, as Mr. Steele-Bodger tries to make out, that veterinary preparations have to be officially approved before being offered for sale, but on the contrary to the very simple reason that there is not a large outlet for them. Certain classes of these preparations have to be submitted to the Department of Agriculture for their approval before they can be put on the market, but Mr. Steele-Bodger might be interested to learn that actual tests (which he describes as "extremely thorough") are not applied to individual preparations.

I have travelled extensively throughout the Union, and have studied the problems of its livestock industry at their source from every angle, and if Mr. Steele-Bodger would like to have accurate information regarding conditions in that country I should be pleased to let him have it.

Meanwhile, I would suggest that Mr. Steele-Bodger, who is clearly writing for propaganda purposes, should refrain from making use of statements and arguments which, I have no doubt through want of knowledge, are inaccurate and misleading to your readers.

Yours faithfully,
Leslie K. Osmond,
Managing Director of Osmond & Sons (Proprietary), Ltd.,
East London, South Africa.
May 12th, 1942.

COMPETENCE OF THE NEWLY-QUALIFIED

Sir,—*Apropos* Mr. J. F. D. Tutt's letter under the above heading in your issue (May 16th), may I also suggest another book for veterinary students which they would enjoy reading during the summer vacation, and, as a result of so doing, they should be able to discuss up-to-date farming with the average farmer. Furthermore they would be able, when talking to some farmers of the old school, to push the hands of the clock forward. This valuable and interesting book was presented to me by a colleague and friend, Mr. Gladstone Mayall, M.R.C.V.S., who saw the advisability of a refresher in up-to-date farming in this country for one who had seen only tropical farming for many years. The title of the book is The New Farming, published by Thomas Nelson & Sons, Ltd., price 2s., and it is written by D. H. Robinson, PH.D., the well-known Editor of Agricultural Progress and lecturer at Harper Adams Agricultural College, who writes lucidly on soil and fertility, the breeding of plants and farm animals, feeding, etc., etc.

Yours faithfully,

Tymawr Farm, Edward Morgan.
Pontrhydygroes,
Aberystwyth.
May 23rd, 1942.

* * * * *

Sir,—In a recent issue of the *Record* there was a request for constructive ideas as to how the alleged lack of "animal-mindedness" of the newly-qualified could be remedied. Two very important and practical suggestions are contained in the Loveday Report, the first that all students without previous agricultural experience should be required to spend six months on a farm prior to commencing their fourth year, and the second that a Field Station and Field Hospital should be established in connection with each veterinary college. At the second conference of veterinary students, held at Easter, both these points were considered. It was felt that four months' farm experience should be required before sitting for the third professional examination, and that every effort should be made to set up Field Stations and Hospitals.

We in Liverpool are privileged, in that final year students are now resident at a Field Station and Hospital under the direction of Professor J. G. Wright. Here, residing in the country, the student has ample opportunity to observe animals in health and devotes part of his time to the care, management and husbandry of the Field Station livestock, in addition to the clinical work of studying the course of treatment of the hospital in-patients.

We are confident that training along these lines would do much to solve the problem.

We are,
Yours faithfully,
M. Wynne (*President*),
A. Carlyle (*Secretary*),
The University, Liverpool University
Liverpool. Veterinary Society.
May 22nd, 1942.

* * * * *

Sir,—Now that several veterinary surgeons of considerable experience have asserted their superiority over the junior members and students of the profession, would these gentlemen pause to consider how they acquired their skill in dealing with animals in health?

If their conclusions could be published they might possibly contribute towards the perfecting of veterinary education.

Yours respectfully,
E. James Roberts
The Royal Veterinary College, (Final Year Student).
Streatley,
Berks.
May 11th, 1942.

Weekly Wisdom

The pursuit of medicine takes into account neither evidence that is exact nor methods of reasoning that are logical as in the sciences. To entertain the hope that medicine will in its turn become a science one would have to regard the human mind as competent to dwell upon the mystery of life on a rationalist pattern, and nothing warrants the assumption that at the moment the mind is fitted for such an effort. Practitioners of medicine may derive consolation from the belief that they can place at the service of their art, which also allows scope for the assertion of personality, all the resources of science and their ingenuity as educated men."—Leclainche, *Histoire de la Médecine Vétérinaire,* 1936, p. 784.

NOTICES

ORIGINAL Articles are accepted only on the understanding that the "Veterinary Record" has priority of publication.

IT must be understood that the acceptance by the National Veterinary Medical Association of an advertisement for either the professional or commercial ("display") section does not imply a recommendation and that no responsibility is accepted with regard to the accuracy of any claims made or other statements therein contained.

Lancashire Division, N.V.M.A.

A GENERAL Meeting of the Association will be held in the Queen Hotel, City Road, Chester, on Tuesday, June 2nd, 1942, at 2.30 p.m.

The President, Mr. H. Raynor Hewetson, M.R.C.V.S., will occupy the chair.

AGENDA

Routine.
Address on "Problems of Milk Production," by W. B. Mercer, Esq., M.B.E., M.C., B.SC., Executive Officer, Cheshire War Agricultural Executive Committee.

The War Agricultural Executive Committee is anxious to secure the support of the Veterinary Profession in an intensive "drive" to improve the milk position and it is hoped that as many members as possible will attend this meeting.
Any other business.

G. O. DAVIES, *Hon. Secretary.*

Central Division, N.V.M.A.

A GENERAL Meeting of the Central Veterinary Society will be held at the Conway Hall, Red Lion Square, W.C.1, on Thursday, June 4th, at 2.30 p.m. Tea and light refreshments will be provided.

AGENDA

Routine.
Nominations and Elections.
Election of representatives to the Council of the N.V.M.A.
Morbid specimens, case records, etc.
Paper: "Affections of the hip joint of the dog, with special reference to differential diagnosis." (X-ray films and *post-mortem* specimens will be shown). Mr. C. Formston, M.R.C.V.S., and Mr. G. C. Knight, M.R.C.V.S.
Any other business.

J. W. H. HOLMES, *Hon. Secretary.*

Scottish Metropolitan Division, N.V.M.A.

A MEETING of the Division will be held in the Royal Hotel, Union Street, Dundee, on Wednesday, June 10th, at 2 p.m., with the President, Sir Arthur Olver, in the chair.

AGENDA

Routine.

Short Papers:—
(1) "The use of Nerve Blocking in General Practice," by J. S. A. Spreull, PH.D., M.R.C.V.S., Dundee.
(2) "Some Observations on Common Methods of Castration," by J. F. Watson, M.R.C.V.S., Milnathort.
(3) "The Local Application of Sulphonamides," by A. J. McLennan, B.SC., M.R.C.V.S., Edinburgh.

Any other business.

ALEX. ROBERTSON, *Hon. Secretary.*

North Wales Division, N.V.M.A.

A MEETING of the North Wales Division will be held at the Swiss Café, Llandudno, on Friday, June 19th, at 2 p.m. The President, Mr. W. T. Rowlands, will occupy the chair.

AGENDA

Routine.
Correspondence.
Nominations and Elections.
Address: "Sub-clinical Helminthiasis of Farm Animals," by Dr. E. L. Taylor, M.R.C.V.S., D.V.H.
Discussion.
Any other business.

H. E. HARBOUR, *Hon. Secretary.*

PROFESSIONAL ADVERTISEMENTS

These will be received at 36, GORDON SQUARE, W.C.1 up to TUESDAY MORNING

For Members of the Association

First insertion: 1/- for each six words or less, minimum 18 words (3/-). *Repeat insertion*: 6d. for each six words or less, minimum 18 words (1/6).

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First insertion: 2/6 for each six words or less, minimum 18 words (7/6). *Repeat insertions*: 1/3 for each six words or less, minimum 18 words (3/9).

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First insertion: 8d. for each six words, minimum 18 words (2/-). *Repeat insertions*: 4d. for each six words, minimum 18 words (1/-).

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Replies to Box Numbers should be addressed to the appropriate Box at the Office. Telegrams addressed to Box Numbers will be forwarded by post unless accompanied by a "reply paid" form.

APPOINTMENTS VACANT

APPLICANTS for posts are requested not to enclose original testimonials when replying to advertisements. Copies answer the same purpose and cause no inconvenience if mislaid.

WANTED, Assistant in country practice. Reply, giving age and other particulars; also references; live in.—HALL, M.R.C.V.S., Dargle House, Knaresborough.

LOCUM required for two or three weeks; mixed practice; full particulars.—Box 505.

LOCUM required in Surrey small animal practice fo rlast fortnight in June. Must be experienced and motorist. Live in. Send full particulars.—Box 506.

WANTED, capable Locum for mixed practice, mainly agricultural, June 15th, for about six weeks. References and full particulars.—Box 507.

APPOINTMENTS REQUIRED

1940 GRADUATE requires Assistantship; experienced in country practice; trained in sterility treatment; excellent references; motorist.—HAY, c/o HALL, M.R.C.V.S., Dargle House, Knaresborough.

GLASGOW, 1941, Graduate, experienced mixed practice, 24, tall; motorist; references; good academic record.—Box 501.

EDINBURGH Graduate, 27, tall, desires Assistantship or Locum. Experience mixed practice. Good references. Free now.—Box 508.

JULY, 1941, Graduate available in early June for temporary or permanent employment; sound knowledge of agricultural practice and Panels; own car; age 24.—Full particulars and references from Box 489.

VETERINARY SURGEON, two years' sound experience mixed country practice, desires post. Farmer's son: Welsh speaking; experienced sterility and obstetrics; knowledge of Ministry procedures; own car available if necessary; excellent references.—Box 509.

1941 GLASGOW Graduate desires Assistantship of Locum; tall and experienced in large animal and canine practice.—Box 511.

PRACTICES REQUIRED

MEMBER desires to purchase agricultural practice, preferably the Midlands, or Partnership with early succession.—Box 498.

MEMBER desires to purchase agricultural practice. Would consider Partnership or Assistantship with view to Partnership. Comprehensive experience in all branches.—Box 510.

PARTNERSHIP

PARTNER required for old-established unopposed mixed practice in Midlands. Panel A. Turnover about £1,700. Capable of increase. Capital essential.—Box 495.

MISCELLANEOUS

VETERINARY LABORATORY SERVICE for veterinary practitioners offered by Dr. Tom Hare, assisted by A. B. Orr, B.SC., M.R.C.V.S., includes post-mortems, laboratory tests, analyses for poisons, the preparation and supply of vaccines, tuberculins, etc. Write for schedule of stock vaccines to Dr. Tom Hare, 529, Finchley Road, London, N.W.3. Telephone: Hampstead 3745.

MAJOR C. W. TOWNSEND, F.R.C.V.S., Long Stanton, Cambs, Telephone WILLINGHAM 49, will be pleased to operate on rig horses for members of the profession.

MICROSCOPES.—Many superior secondhand instruments and objectives by best makers. 2d. stamp for list. Also bought for cash or part-exchanged.—Chards (Regd.) Specialists, est. 67 years, 10, Devonshire Road, Forest Hill, S.E.23.

TUBERCULIN, Mallein, etc., may be obtained by members of the veterinary profession from the Royal Veterinary College. Orders should be addressed to the Department of Preventive Medicine—Temporary address, The Cottage, Streatley, Berks.

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Principal:
Colonel Sir A. OLVER, C.B., C.M.G., F.R.C.V.S.

120th SESSION COMMENCES OCTOBER

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College Calendar with full particulars of Examinations, Bursaries, etc., may be obtained from A. C. DOUIL, C.A., *Secretary.*

PARTURITION OVERALLS, Etc.

Veterinary Surgeons can now obtain Parturition garments, Clinical Coats, Overalls and Wellingtons, coupon free, on obtaining a voucher from Ministry of Agriculture, Animal Health Division, 2, Fearnlea Hotel, St. Annes-on-Sea. We have stocks of these goods and can despatch by return.

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Communications for the General Secretary, N.V.M.A., including those relative to the business side of "The Veterinary Record" and changes of address, should now be addressed to 36, Gordon Square, London, W.C.1, as should all communications for the Editorial Representative, including literary matter and "copy" for advertisements; also replies to advertisement Box Nos.